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1. Your reference

2. Patent application number
(The Patent Office will fill in this part) 0301870.2 27 JAN 2003

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

QIN GANG
63 GRAYS INN ROAD
LONDON WC1X 8TL

Patents ADP number *(if you know it)*

If the applicant is a corporate body, give the country/state of its incorporation

6584700001

4. Title of the invention

A TUMBLING MAGNET ELECTRIC GENERATING SYSTEM

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Patents ADP number *(if you know it)*

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
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Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	
Description	2
Claim(s)	2
Abstract	1
Drawing(s)	3 + 3

10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	1
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Signature [signature] Date 26-01-2003

12. Name and daytime telephone number of person to contact in the United Kingdom 0207-9163466 QIN GANG

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Notes

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A TUMBLING MAGNET ELECTRIC GENERATING SYSTEM

A voltage is set up in a coil placed in a magnetic field whenever the magnetic field flux through the coil changes. This effect is called electromagnetic induction. If the coil forms part of a closed circuit, the induced voltage causes a current to flow in the circuit. The majority of electrical generating systems are based on the phenomenon of electromagnetic induction.

This invention relates to an electric generating system in which electromagnetic induction is effected by way of a permanent, tumbling magnet producing a varying magnetic field flux through a coil.

This system consists of two permanent magnets. The first magnet is set free to tumble within a tumbling chamber around which a coil is externally looped. The tumbling chamber is of sufficient dimensions to allow the first magnet to tumble freely. The second magnet is external to the tumbling chamber. There is some relative motion between the first magnet and the second magnet. As the two magnets pass close to each other, the mutual interaction of the magnetic fields of the first magnet and the second magnet causes enough tumbling motion of the first magnet. As the first magnet tumbles in the tumbling chamber, a rapidly varying magnetic field flux is effected through the coil and a corresponding electric current flows through the coil and produce electricity to run an electric appliance, such as an LED (Light Emitting Diode).

The best application of this electric generating system is for the purpose of safety illumination on a bicycle.

A specific embodiment of the invention will now be described by way of examples and with reference to the accompanying drawing in which:

Fig 1 shows a cross-sectional view of this electric generating system. The first magnet (9) is set free to tumble within a tumbling chamber (10) around which a coil (11) is externally looped. The two ends of the coil (11) are connected to the terminals of an LED (3). There is some arbitrary, relative motion between the first magnet (9) and the second magnet (2). The magnets drawn with a dotted line represent alternative, relative motions of the second magnet (2) with respect to the first magnet (9). As the first magnet (9) and the second magnet (2) pass close to each other, the mutual interaction of the magnetic fields of the first magnet and the second magnet is sufficient to cause the first magnet (9) to tumble in the tumbling chamber (10). As the first magnet (9) tumbles in the tumbling chamber, a rapidly varying magnetic field flux is effected through the coil (11) and a corresponding electric current flows through the coil (11) thus lighting the LED (3).

Fig 2 shows the electric generating unit (4) installed on the front wheel fork (1) of a bicycle by way of a support (5). The support (5) is made of non-magnetic materials. The second magnet (2) is fixed on the spokes (6) of the bicycle wheel (7). As the wheel rotates, the second magnet (2) will pass close to the generating unit (4), containing the first magnet (9), once per 360 degree turn and will generate electricity as previously described.

Fig 3 represents a cross-sectioned front view of the system. The generating unit (4) is made from a coil of insulated copper wire (11) wound around a tumbling chamber (10) made out of non-magnetic, synthetic materials. The two coil ends are connected to the terminals of an LED (3). The first magnet is a disc shaped permanent magnet (9) and is enclosed within the tumbling chamber (10). The tumbling chamber (10) is of sufficient dimensions to allow the first magnet (9) to tumble freely. The second magnet (2) (a permanent magnet) is fixed to the spokes (6) of the bicycle wheel (7) by a fixer (8). As the bicycle wheel (7) rotates, the second magnet (2) passes close to the first magnet (9) whereupon the interaction of their magnetic fields will cause the first magnet (9) to tumble in the tumbling chamber (10). As the first magnet (9) tumbles, it produces a rapidly varying magnetic field that induces an electric current to flow through the coil (11) and to light the LED (3).

Figs 4-6 are viewed orthogonal to the plane of rotation of a bicycle wheel (7) and include cross-sectional views of the tumbling chamber (10). Figs 4-6 illustrate the operation of the electric generating system during one revolution of a bicycle wheel (7).

Fig 4 shows the second magnet (2) approaching the first magnet (9). The interaction of their magnetic fields will not be strong enough to cause the first magnet (9) to tumble in the tumbling chamber (10). No electric voltage will appear in the coil (11). The LED (3) is off.

Fig 5 shows the second magnet (2) passing close to the first magnet (9) as the bicycle wheel (7) rotates. When distance between the first magnet and the second magnet is at a minimum, the magnetic interaction will cause the first magnet (9) to tumble in the tumbling chamber (10). As the first magnet (9) tumbles, a rapidly varying magnetic field flux induces an electric current to flow in the coil (11) and thus causes the LED (3) to illuminate.

Fig 6 shows the second magnet (2) having moved pass the first magnet (9). The interaction of their magnetic fields will not be strong enough to cause the first magnet (9) to tumble in the tumbling chamber (10). No electric voltage will appear in the coil (11). The LED (3) is off.

Logically, it follows that the LED (3) will a flickering illumination once per revolution of the wheel (7). As the revolutions per second increase, the frequency of flickering increases proportionally.

CLAIMS

1. A tumbling magnet electric generating system comprising of two permanent magnets. The first magnet is set free to tumble within a tumbling chamber around which a coil is externally looped. The tumbling chamber is of sufficient dimensions to allow the first magnet to tumble freely. The second magnet is external to the tumbling chamber. There is some relative motion between the first magnet and the second magnet. As the two magnets pass close to each other, the mutual interaction of the magnetic fields of the first magnet and the second magnet causes enough tumbling motion of the first magnet. As the first magnet tumbles in the tumbling chamber, a rapidly varying magnetic field flux is effected through the coil and a corresponding electric current flows through the coil and produce electricity to run an electric appliance.

2. A tumbling magnet electric generating system as claimed in claim 1, the tumbling chamber is made of non-magnetic materials.

3. A tumbling magnet electric generating system as claimed in claim 1, an coil of insulated copper wire wound around outside of the tumbling chamber, the two ends of the coil are connected to the terminals of an electric appliance.

4. A tumbling magnet electric generating system as claimed in claim 1, shapes of the first magnet are vary, such as disk, cylinder, square....

5. A tumbling magnet electric generating system as claimed in claim 1 and 2, shapes of the tumbling chamber are vary, such as cylinder, ball, square....

6. A tumbling magnet electric generating system as claimed in claim 1, this electric generating system can be installed on a bicycle for purpose of safety illumination.

7. A tumbling magnet electric generating system as claimed in claim 1 and 6, the second magnet is fixed on the rotating wheel of the bicycle.

8. A tumbling magnet electric generating system as claimed in claim 1 and 6, the electric generating unit contains the first magnet is installed on a stationary part of the bicycle such as on front wheel fork by a supporter.

9. A tumbling magnet electric generating system as claimed in claim 1, 6, 7 and 8, the rotating second magnet pass close to the first magnet, once per 360 degree turn.

10. A tumbling magnet electric generating system as claimed in claim 1, 6, 7, 8, and 9, as the second magnet pass close to the first magnet, whereupon the interaction of their magnetic fields will cause the first magnet to tumble in the tumbling chamber of the electric generating unit.

11. A tumbling magnet electric generating system as claimed in claim 1, 6, 7, 8, 9 and 10, the tumbling first magnet produces a rapidly varying magnetic field that induces an electric current to flow through the coil and light the LED as a safety signal on the bicycle.

ABSTRACT

A TUMBLING MAGNET ELECTRIC GENERATING SYSTEM

This invention relates to an electric generating system in which electromagnetic induction is effected by way of a permanent, tumbling magnet producing a varying magnetic field flux through a coil. This system consists of two permanent magnets. The first magnet is set free to tumble within a tumbling chamber around which a coil is externally looped. The tumbling chamber is of sufficient dimensions to allow the first magnet to tumble freely. The second magnet is external to the tumbling chamber. There is some relative motion between the first magnet and the second magnet. As the two magnets pass close to each other, the mutual interaction of the magnetic fields of the first magnet and the second magnet causes enough tumbling motion of the first magnet. As the first magnet tumbles in the tumbling chamber, a rapidly varying magnetic field flux is effected through the coil and a corresponding electric current flows through the coil and produce electricity to run an electric appliance, such as an LED (Light Emitting Diode).

(use Fig 1)

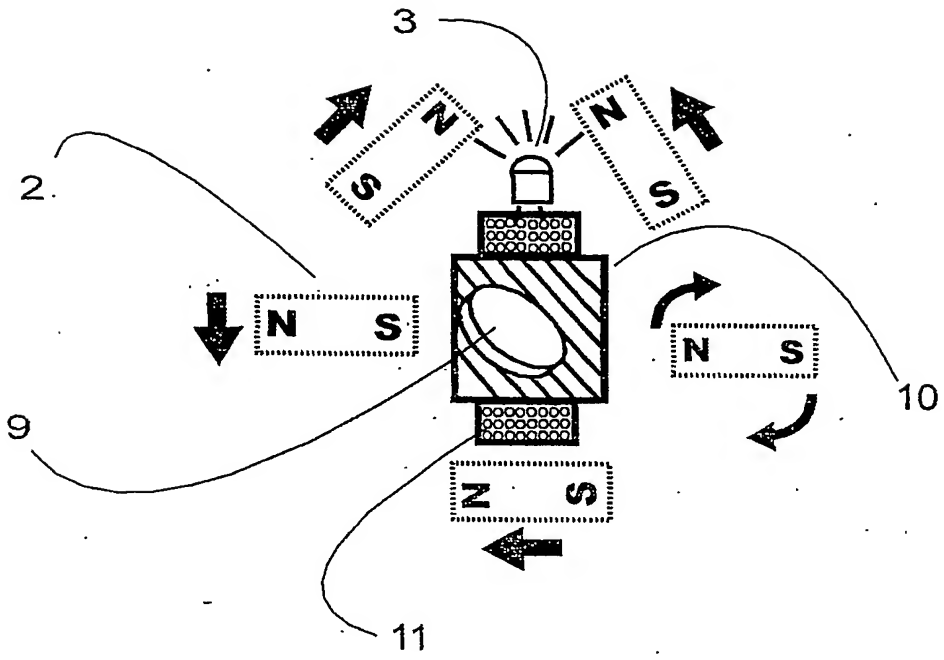


FIG 1

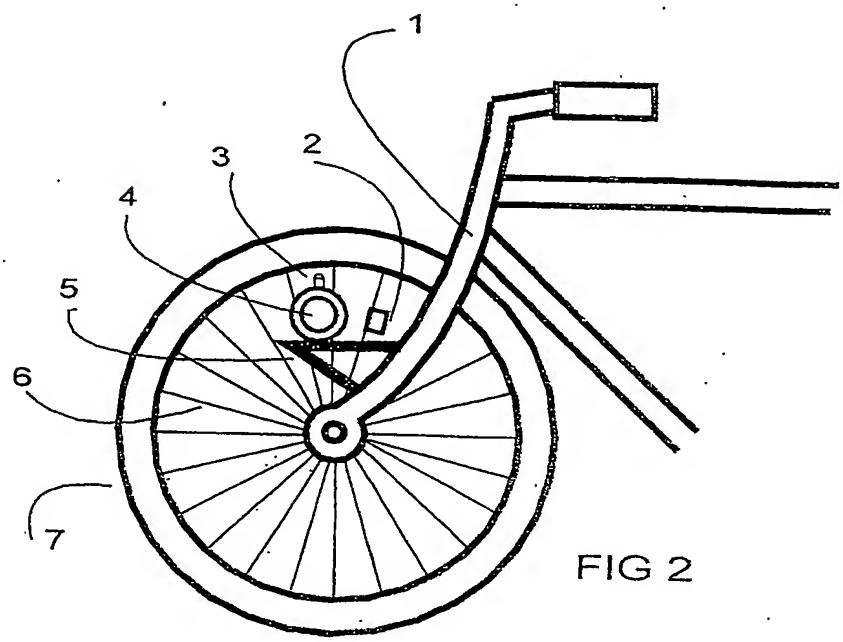
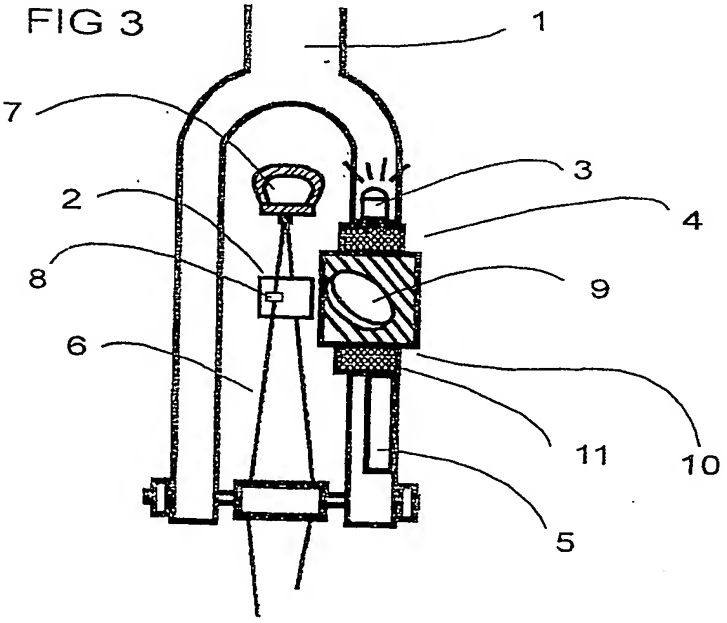


FIG 2

FIG 3



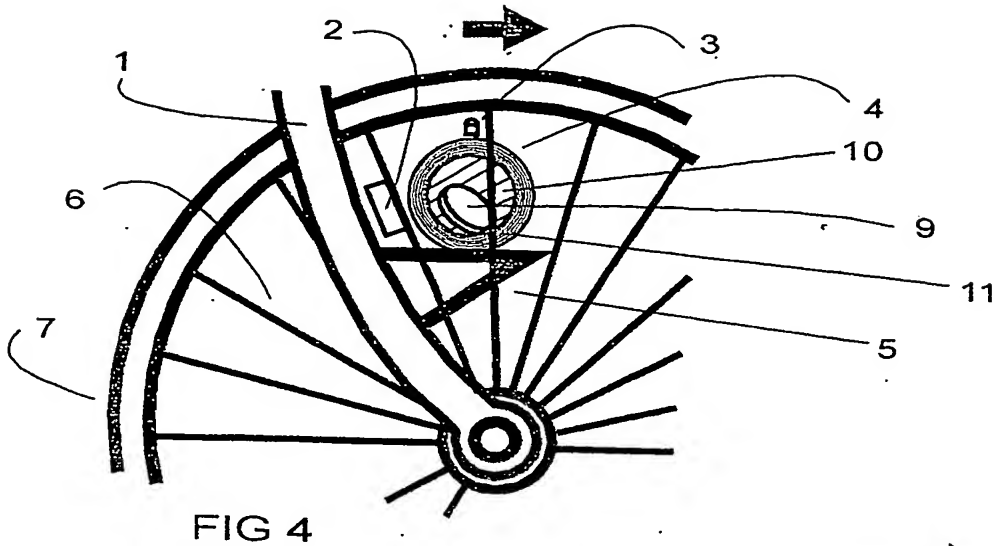


FIG 4

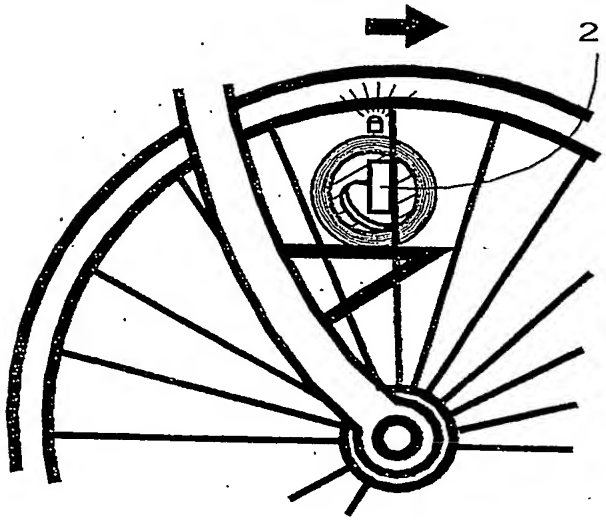


FIG 5

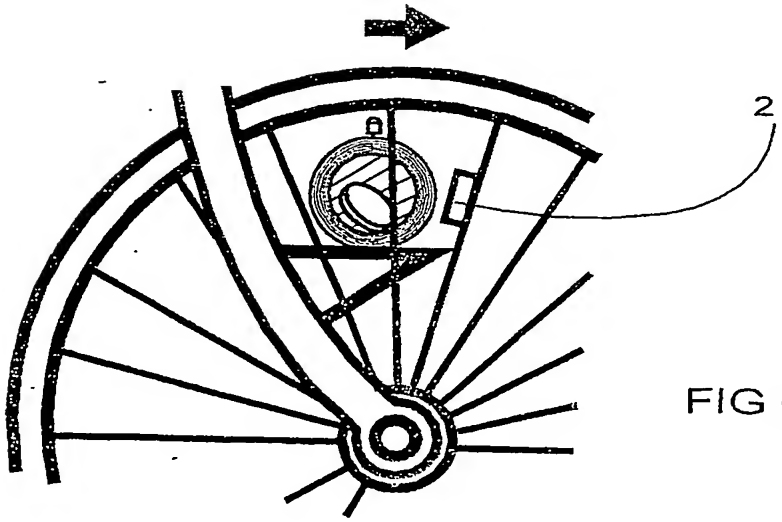


FIG 6